

UNITED STATES PATENT APPLICATION

for

IMAGING SERVICE FOR AUTOMATING THE DISPLAY OF IMAGES

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# IMAGING SERVICE FOR AUTOMATING THE DISPLAY OF IMAGES

## RELATED APPLICATIONS

This application claims the benefit of U.S. Provisional Application No.  
5 60/181,779, filed February 11, 2000.

## FIELD OF THE INVENTION

This invention relates generally to imaging services, and more particularly to  
automating the display of a plurality of images to create a visual presentation.

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## BACKGROUND OF THE INVENTION

Personal computers can execute programs that display visual presentations such as  
motion pictures. Devices such as scanners and digital cameras enable computer users to  
capture images, load them into their computers, and view them using output devices such

as monitors or printers. Furthermore, computers users can share pictures with friends over communications networks by using e-mail. As loading, manipulating, and viewing visual images on personal computers becomes easier and more popular, computer users may wish to create more sophisticated presentations of these images. For example, computer users may wish to create a visual presentation that zooms into or away from a location or that pans around a location. The visual presentation could be in the form of a motion picture, a vertical morph, or a holograph.

Personal computers can display such visual presentations, but users face significant difficulties when trying to create them. Creating the visual presentation requires accessing a number of pictures of the location, modifying them, arranging them, and combining them. Performing these steps requires a high degree of technical knowledge that most computer users do not possess. Furthermore, performing these steps is time-consuming, even for a computer user who has a high level of technical ability. Therefore, an imaging service is needed to perform the technically difficult and time-consuming tasks associated with automating the display of a plurality of images to create a visual presentation.

### SUMMARY OF THE INVENTION

The invention is an imaging service that automates the display of a plurality of images to create a visual presentation. The imaging service accesses images from a client computer, from a database, or from both. It then arranges the images according to a specified characteristic and combines them in a visual presentation. In an embodiment of the invention, the computer user can specify a number of parameters for controlling the appearance of the visual presentation. In another embodiment of the invention, the imaging service modifies the images so they are consistent in appearance. In a further

embodiment, the imaging service receives compensation before sending the visual presentation to a client.

The imaging service greatly simplifies the process of creating a visual presentation that displays multiple images of a location selected by a computer user. To use the  
5 imaging service, the computer user is required to perform only basic and routine tasks on his/her computer. If the computer user can load a picture into his/her computer using a digital camera or a scanner and can use the Internet, then he/she will be able to create sophisticated visual presentations using the imaging service. Furthermore, the imaging service accelerates the process of creating visual presentations by quickly performing tasks  
10 that otherwise would be tedious and time consuming.

The present invention describes systems, clients, servers, methods, and computer-readable media of varying scope. In addition to the aspects and advantages of the present invention described in this summary, further aspects and advantages of the invention will become apparent by reference to the drawings and by reading the detailed description that  
15 follows.

### **BRIEF DESCRIPTION OF THE DRAWINGS**

FIG. 1 is a diagram illustrating a system-level overview of an embodiment of the invention;

20 FIG. 2 is a diagram illustrating one embodiment of an operating environment suitable for practicing the invention;

FIG. 3 is a diagram illustrating one embodiment of a computer system suitable for practicing the invention; and

FIG. 4 is a flowchart of a method to be performed by a server according to an embodiment of the invention.

### DETAILED DESCRIPTION OF THE INVENTION

5 A system level overview of the operation of an embodiment of the imaging service 100 is described by reference to FIG. 1. Captured images 150 and database images 160 are combined to create a visual presentation 180. This system level overview describes an embodiment of the imaging service 100 employing a client/server system. However, other embodiments of the imaging service 100 will be readily apparent to one of skill in the art and fall within the scope of the present invention.

10 The imaging service 100 includes a client 110 and a server 120. A digital input device 150 is connected to the client 110. A computer user loads captured images 150 into the client 110 using the digital input device. In one embodiment, the digital input device 130 is a digital camera. The computer captures the captured images 150 with a digital  
15 camera, which stores the captured images 150 in digital form so that they can be loaded directly into the client 110. In another embodiment, the digital input device 130 is a scanner. The computer user captures the captured images 150 with a conventional camera and uses the scanner to load the captured images 150 into the client 110. The captured images 150 are saved in an appropriate file format, such as a Joint Photographic Experts  
20 Group (JPEG) file, a Graphics Interchange Format (GIF) file, or a Portable Network Graphics (PNG) file. The operation of digital cameras and scanners, as well as the various file formats for saving pictures in a computer, are well known to those of skill in the art.

The imaging service 100 also includes an image database 140. The image database 140 contains a number of database images 160 that are accessed by the server 120. The

database images 160 also are stored in an appropriate file format for pictures, such as a JPEG file, a GIF file, or a PNG file. In one embodiment of the invention, the database 140 is located in the server 120. In another embodiment, the database 140 is located on another server directly coupled to the server 120. In another embodiment, the database 140 is located in another server connected to the server 120 through a Local Area Network (LAN). In yet another embodiment, the database 140 is located in another server that is connected to the Internet. Numerous government and private organizations maintain databases containing satellite images of various locations on Earth. For example, TerraServer® maintains an extensive database containing high-resolution images of many cities throughout the United States.

Captured images 150 and database images 160 are arranged in a series of presentation images 170. The presentation images 170 are combined to create a visual presentation 180. In one embodiment, the computer user can choose among a variety of formats for the visual presentation. The computer user may choose to make the visual presentation a motion picture. The visual presentation can be a QuickTime™ movie file, a Moving Picture Experts Group (MPEG) file, or an Audio Video Interleaved (AVI) file. Numerous multimedia programs may be used to create a motion picture, and such programs are well known to those having skill in the art. Alternatively, the computer user may choose to make the visual presentation a vertical morph or a holographic image.

In one embodiment, shown in FIG. 2, the operating environment for the imaging service includes a client 110 and a server 120 connected to an Internet Service Provider (ISP) 200. Connection to the ISP 200 facilitates communication between the client 110 and the server 120 over the Internet. It is readily apparent that the present invention is not limited to Internet access and Internet web-based sites. In another embodiment, a stand-

alone computer performs the imaging service. In another embodiment, the client and the server are directly coupled. In a further embodiment, the client and the server are connected through a Local Area Network (LAN). The different operating environments in which multiple computers can communicate with each other are well known to those of skill in the art.

One embodiment of a server 120 is illustrated in FIG. 3. The server 120 includes a processor 300, memory 310, and input/output devices 320. The processor 300, memory 310, and input/output devices 320 are connected through a bus 330. The memory 310 is configured to store instructions which, when executed by the processor 300, perform the method described herein. The memory 310 may also store the captured image and database images used in the method described herein. Input/output devices 320 may include a keyboard, a mouse or other pointing device, a digital camera, a scanner, a disk drive, a monitor, and a printer.

The system level overview of the operation of an embodiment of the invention has been described in this section of the detailed description. While the invention is not limited to any particular arrangement of computer systems and components, for sake of clarity a simplified arrangement has been described.

Next, the particular methods of the invention are described in terms of computer software with reference to a flowchart illustrated in FIG. 4. The methods to be performed by the computer constitute computer programs made up of computer-executable instructions. Describing the methods by reference to a flowchart enables one skilled in the art to develop programs including instructions to carry out the methods on a suitable computer (the processor of the computer executing the instructions from computer-readable media). If written in a programming language conforming to a recognized

standard, such instructions can be executed on a variety of hardware platforms and for interface to a variety of operating systems. In addition, the present invention is not described with reference to any particular programming language. It will be appreciated that a variety of programming languages may be used to implement the teachings of the invention as described herein. Furthermore, it is common in the art to speak of software, in one form or another (e.g., program, procedure, process, application, module, logic...), as taking an action or causing a result. Such expressions are merely a shorthand way of saying that execution of the software by a computer causes the processor of the computer to perform an action or a produce a result.

Referring to FIG. 4, the acts to be performed by a server system performing the imaging service are shown. The server sends a web page for the imaging service to the client 401. The web page provides instructions to the computer user for using the imaging service and prompts the computer user to input various types of information 403. The web page instructs the computer user to specify the source of the images that are used to create the visual presentation. It enables the computer user to specify whether the visual presentation includes only captured images, only database images, or a combination captured images and database images. Additionally, the web page instructs the computer user to input location information such as a street address or location coordinates if the user wants the visual presentation to include any database images. Furthermore, the web page instructs the computer user to specify a characteristic by which the images are arranged. For example, the computer user may specify distance or magnification if he/she wants the visual presentation to zoom into or away from a location. Alternatively, the computer user may specify perspective or angle if he/she wants the visual presentation to pan around a location.



In alternate embodiments of the invention, the web page instructs the computer user to enter additional information relating to the appearance of the visual presentation.

In one embodiment, the web page instructs the computer user to specify the type of visual presentation that the imaging service creates. For example, the computer user could

5 choose to view the visual presentation as a motion picture, a vertical morph, or a hologram. In another embodiment, the web page instructs the computer user to specify how quickly the visual presentation zooms in or out, or how quickly the visual presentation pans around the location. In yet another embodiment, the web page instructs the computer user to specify whether the visual presentation stops during zooming or  
10 panning. In a further embodiment, the web page instructs the computer user to specify whether the images resolve or fade during the visual presentation. In an even further embodiment, the web page instructs the computer user to specify whether the visual presentation appears in black-and-white or in color.

After the computer user inputs the necessary information and follows the  
15 instructions on the web page, the server receives the information from the client 405. Then, the server accesses presentation images according to the information inputted by the computer user 407. If the computer user specified that the visual presentation include only database images 409, the server accesses all of the presentation images from a database 411. Alternatively, if the computer user specified that the visual presentation include only  
20 captured images, the server accesses all of the presentation images from the client. If the computer user specified that the visual presentation include both captured images and database images, the server accesses the presentation images both from a database and from the client 417.



The particular methods performed by a server system of an embodiment of the invention have been described. The method performed by the server has been shown by reference to a flowchart illustrated in FIG. 4, including all the acts from 401 until 429. Additionally, a method performed by a server in an alternative embodiment of the invention has been shown by reference to a flowchart illustrated in FIG. 5, including all the acts from 401 to 429.

## Conclusion

A system and method for creating a visual presentation of zooming into or away from a picture has been described. Although specific embodiments have been illustrated and described herein, it will be appreciated by those of ordinary skill in the art that any arrangement which is calculated to achieve the same purpose may be substituted for the specific embodiments shown. This application is intended to cover any adaptations or variations of the present invention.

For example, those of ordinary skill within the art will appreciate that the invention can be practiced without using a client/server system. The imaging service can be performed on a stand-alone computer or on directly coupled computers. Furthermore, the client/server system is not limited to computers connected to the Internet through an ISP. The client and server can be connected to a LAN. The terminology used in this application with respect to a method for creating a zoom effect is meant to include all of these environments. Therefore, it is manifestly intended that this invention be limited only by the following claims and equivalents thereof.

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